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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
|-----------------|-------------|----------------------|---------------------|

09/388,265    09/01/99    HO

~~82866-000100~~

MM41/1003

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| EXAMINER |
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| ART UNIT | PAPER NUMBER |
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2811

DATE MAILED: 10/03/01

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.

09/388,265

Applicant(s)

HO ET AL.

Examiner

HUNG VU

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on Jul 5, 2001
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 8-27 is/are pending in the application.
- 4a) Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a) ☐ All b) ☐ Some\* c) ☐ None of:

- ☐ Certified copies of the priority documents have been received.
- ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
- ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\*See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892) 18) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 6 20) ☐ Other:

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## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 8-11, 16, and 19-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamazaki (PN 4,559,552).

Yamazaki et al. discloses an ohmic contact (2,61) in a semiconductor device which is formed on a semiconductor material (5), the ohmic contact comprising a mixture of p-type semiconductor oxide and metal (indium oxide, antimony oxide, tin oxide aluminum, silver) (Note col. 2, line 18 to col. 3, line 7);

wherein the p-type semiconductor oxide includes a single oxide;

wherein the p-type semiconductor oxide includes a mixture of various oxides (indium oxide, antimony oxide);

wherein the conductive layer is a transparent conductive film. Note Figures 1, 3A, and 8-14 of Yamazaki.

Note that in claim 11 and 22, it is inherent that a solid solution layer is being formed as result of the semiconductor oxide.

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2. Claims 8-11, 14, 16, and 19-25 are rejected under 35 U.S.C. 102(a) as being anticipated by Howe (PN 4,521,800).

Howe discloses an ohmic contact (12,14) in a semiconductor device which is formed on a semiconductor material (10), the ohmic contact comprising a mixture of p-type semiconductor oxide and metal (MgO, MgAl<sub>2</sub>O<sub>4</sub>, B<sub>2</sub>O<sub>3</sub>, ZrO<sub>2</sub>, TiO<sub>2</sub>, CeO<sub>2</sub>, palladium, platinum, iridium, ruthenium, tantalum, platinum silicide, etc);

wherein the p-type semiconductor oxide includes a single oxide;

wherein the p-type semiconductor oxide includes a mixture of various oxides;

wherein the metal is Au, Pt, Rh, Ru, or Ir;

wherein the conductive layer is a transparent conductive film. Note Figure of Howe.

Note that in claim 11 and 22, it is inherent that a solid solution layer is being formed as result of the semiconductor oxide.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 12-15, 17-18, and 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki (PN 4,559,552) in view of Nakamura et al. (PN 5,563,422, of record).

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With regard to claims 12, 15, 17, and 26, Yamazaki discloses all of the claimed limitations except the material of the semiconductor is p-type  $\text{Al}_x\text{Ga}_y\text{In}_z\text{N}$ , and  $0 < x, y, z < 1$ , and  $x + y + z = 1$ , or p-type GaN. However, Nakamura et al. discloses an ohmic contact having semiconductor material is p-type  $\text{Al}_x\text{Ga}_y\text{In}_z\text{N}$  or p-type GaN. Note Figures 2-4 of Nakamura et al.. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the semiconductor of Yamazaki's having the material selecting from a p-type  $\text{Al}_x\text{Ga}_y\text{In}_z\text{N}$  or p-type GaN, such as taught by Nakamura et al., in order to improve the performance of the light-emitted device.

With regard to claims 13, 14, 18, and 27, Yamazaki and Nakamura et al. disclose all of the claimed limitations except the material of the p-type semiconductor oxide and the metal.

However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the p-type semiconductor oxide and the metal of Yamazaki's and Nakamura et al.'s having the materials as that claimed by Applicants, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

4. Claims 12-15, 17-18, and 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Howe (PN 4,521,800) in view of Nakamura et al. (PN 5,563,422, of record).

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With regard to claims 12, 15, 17, and 26, Howe discloses all of the claimed limitations except the material of the semiconductor is p-type  $\text{Al}_x\text{Ga}_y\text{In}_z\text{N}$ , and  $0 < x, y, z < 1$ , and  $x + y + z = 1$ , or p-type GaN. However, Nakamura et al. discloses an ohmic contact having semiconductor material is p-type  $\text{Al}_x\text{Ga}_y\text{In}_z\text{N}$  or p-type GaN. Note Figures 2-4 of Nakamura et al.. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the semiconductor of Howe's having the material selecting from a p-type  $\text{Al}_x\text{Ga}_y\text{In}_z\text{N}$  or p-type GaN, such as taught by Nakamura et al., in order to improve the performance of the light-emitted device.

With regard to claims 13, 14, 18, and 27, Howe and Nakamura et al. disclose all of the claimed limitations except the material of the p-type semiconductor oxide and the metal. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the p-type semiconductor oxide and the metal of Howe's and Nakamura et al.'s having the materials as that claimed by Applicants, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

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*Response to Arguments*

4. Applicant's arguments with respect to claims 8-27 have been considered but are moot in view of the new ground(s) of rejection.

*Conclusion*

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Papers related to this application may be submitted to Technology Center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number

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is (703) 308-7722 and 308-7724. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.

Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to ***Hung Vu*** whose telephone number is **(703) 308-4079**. The Examiner is in the Office generally between the hours of 7:00 AM to 5:30 PM (Eastern Standard Time) Monday through Thursday.

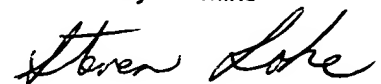
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, ***Tom Thomas***, can be reached on **(703) 308-2772**.

Any inquiry of a general nature or relating to the status of this application should be directed to the **Technology Center Receptionists** whose telephone number is **(703) 308-0956**.

Vu

September 28, 2001

Steven Loke  
Primary Examiner

A handwritten signature in black ink, appearing to read "Steven Loke", written in a cursive style.